

MD-CP42AUPG-MED

USERS MANUAL

42" Medical Grade Display



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2011 Richardson Electronics GmbH

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Specifications are subjected to change without notice.

Table of Contents

Table of Contents	3
Illustrations	3
About This Manual	4
Application and Functional Description	4
Some Basic Facts	4
Intended Use	4
Functional Description	5
Product Features MD-CP42AUPG-MED.....	5
Commentary of used symbols and safety instructions.....	6
To connect the cables	12
Controls & Functions	14
The OSD Wheel Knob.....	14
On-Screen Display	15
OSD – Main Menu Display.....	15
Menu Input-Source.....	16
Image - Settings.....	16
Menu Colour Mode	17
PIP Settings.....	17
OSD - Settings.....	18
Management-Menü.....	18
The OSD Remote Control	19
Cleaning and Disinfection.....	20
Equipment Surface	20
Connection Cables	20
Appendix	21
Technical Information*	21
Timings.....	22
Completion technical data.....	22
External Dimensions	23
Instruction set for serial communication with RS-232	24
Support and Service.....	27
Repairs:	27
Product Warranty	27
Disposal.....	28

Illustrations

Illustration 1 – Name plate from flat-screen display (MD-CP42AUPG-MED)	6
Illustration 2 – Connectors and cabling of MD-CP42AUPG-MED	12
Illustration 3 – OSD Wheel Knob.....	14
Illustration 4 – OSD Main Menu.....	15
Illustration 5 – OSD Remote Control.....	19
Illustration 6 – Timings	22
Illustration 7 – External Dimensions	23

Thank you very much for purchasing the MD-CP42AUPG-MED, a medical safety approved TFT-LCD Display. This display is for medical application approved. In order to use your display correctly, please read the users manual carefully and take notice of the danger, warning and caution notices.

About This Manual

This user manual is intended as an aid in setting up and operating the flat-screen display. We have thoroughly verified all information and hints.

The safety information given in this manual is classified as follows:

DANGER:

Indicates an imminent hazard. If not avoided, the hazard will result in death or serious injury.

WARNING:

Indicates a hazard. If not avoided, the hazard can result in death or serious injury.

CAUTION:

Indicates a potential hazard. If not avoided, this hazard may result in minor personal injury or product/property damage.

Application and Functional Description

Some Basic Facts

The medical safety approved MD-CP42AUPG-MED is a versatile monitor designed for ergonomic and easy handling. The liquid-crystal display (LCD) monitor supports the most common resolutions from 640x480 (VGA) up to 1920x1080 (Full HD) and presents high-brightness, sharp, low-radiation images.

With the OSD wheel knob on the bottom right side of the display, the display parameters can be easily adjusted. Additionally you can control OSD by Remote Control or by serial interface RS-232 with a PC.

Intended Use

The intended use of the MD-CP42AU-MED2 is to display medical imaging data and medical case review applications.

The medical display is only to use with his internal power supply.

Only this combination of display and power supply is approved for use in the medical environment. The flat-panel display and the power supply must not be used outdoors or in areas where an explosion hazard may occur.

For intended use the monitor has to use in landscape mode, portrait mode is not an intended use.

The user has to make sure that requirements from IEC 60601-1 are fulfilled, especially in combination from monitor with other electrical equipment. For fulfillment of this technical requirement you can use if necessary the earthing equipment conductor, which is fixed mounted at the monitor.

The MD-CP42AUPG-MED display is a medical device as defined in the Council Directive 93/42/EEC about medical devices and is class I equipment (MDD).

Functional Description

The medical flat-screen display is built into a slim and ergonomic housing. The monitor displays 16.7 Million colors with a resolution of 1920x1080 pixels.

The display is controlled either analog via a 15-pin D-sub VGA signal cable, digital via a DVI cable or a HDMI signal cable. Different video Inputs allow to control the monitor. The signal is equivalent to the analog and digital standard signals of your PC. After connection of the signal the flat-screen display automatically adapts, as far as possible, to the VGA signal and presents a stable and centered image. Additional display parameters, such as brightness and contrast, can be adjusted via the on-screen menu.

Product Features MD-CP42AUPG-MED

- 42" TFT Liquid Crystal Display
- protection glass
- high brightness
- high contrast ratio
- RS-232 connector for remote control
- IR remote control
- Earthing equipment conductor
- power management
- viewing angles
 - horizontal -89° up to +89°
 - vertical -89° up to +89°
- Optimum resolution 1920 x 1080 (Full HDTV)
- 16.7 million colours
- VGA-, DVI-and HDMI input
- S-Video, Composite Video, RGBS, YPbPr/YCbCr, HD-SDI
- user-friendly OSD-Menu with intuitive wheel-knob, IR remote control or with PC by RS-232 communication
- DDC2B Plug & Play

Commentary of used symbols and safety instructions

Brief statement of rating label and used symbols. Please read carefull.










		Richardson Electronics GmbH Division Canvys Raiffeisenstraße 5 D-78166 Donaueschingen
Model: MD-CP42AUPG-MED		
S/N: 42AUAA0004K1203		
100-240 VAC 50/60 Hz	350VA	18.05.2011
EN 60601-1 IPX1   		

Illustration 1 – Rating plate from flat-screen display (MD-CP42AUPG-MED)

Manufacturer:	Richardson Electronics GmbH Raiffeisenstraße 5 D-78166 Donaueschingen Tel.: +49 (0) 771 / 83 00-0 Fax: +49 (0) 771 / 83 00-80
Model: MD-CP42AUPG-MED	Medical approved Monitor.
100-240 VAC 50/60 Hz 350VA	Use the medical flat-screen display only with his internal power supply, which allocate the needed voltages.
S/N:	Serial number
EN 60601-1	This device was accredited based on medical standard EN 60601-1.
IPX1	Dripping water (vertically falling drops) shall have no harmful effect.
	Confirmation over compliance with medical regulations EN 60601-1.
	WEEE-Reg.-Nr.: DE 64678500
	Manual to consider! Read the manual and consider the safety instructions and the description for correct starting up from flat-screen display.

General Notes on Electrical Safety

Connecting medical electrical equipment to other medical electrical devices and/or other non medical electrical devices, be it for diagnostic or therapeutic purposes or for monitoring, creates a medical electrical system. The standard EN 60601-1-1 and cUL 60601 describes the requirements for these systems.

These systems must be composed of devices that comply either with the standard EN 60601-1 and or cUL 60601 or with the applicable IEC / ISO standard (PCs, for instance, must meet the requirements of the standard IEC 60950) or that are equipped with additional safety features, such as a protective earth conductor, isolating transformer or electrically isolated interface (e.g. optocoupler). This applies to devices of protection class I or II. It is not permitted to integrate protection class 0 devices in medical electrical systems.

In the patient environment, the following maximum enclosure leakage currents (current flowing between two device enclosures or between the enclosure of a device and the protective earth conductor) are permitted for medical devices:

normal condition: 0.1 mA

single fault condition: 0.5 mA (e.g. protective earth conductor interrupted)

Before putting the system into service for the first time, a specialist is required to check that these values are not exceeded.

If the enclosure leakage current of a device or of the system exceeds the limit values stated above, additional protective measures, such as connection to protective earth conductor, isolating transformers or conductive castors, must be implemented to correct this problem.

Safety Information

DANGER:

Explosion Hazard – The display including the power supply is not designed for use in areas of medical locations where an explosion hazard may occur.

In appropriate usage of flammable anesthetics, skin cleansing agents and disinfectants the medical Displays can be used risk less in surgical rooms and intensive care units.

It is not permitted to operate the devices in the presence of flammable substances (e.g. gas).

WARNING:

Shock Hazard — Use only integrated medical power supply:

Alternation current input: 100 - 240V~, 50 - 60Hz, Power max. 350VA

This unit may only used in systems with connected protection earth

WARNING:

Personal Injury — Medical electrical devices may be connected to other devices or to parts of systems only when it has been made certain that there is no danger to the patient, the user, or the environment as a result.

In those instances where there is any element of doubt concerning the safety of connected devices, the user must contact the manufacturers concerned or other informed experts as to whether there is any possible danger to the patient, the operator, or the environment as a result of the proposed combination of devices.

Connecting medical electrical devices to other medical electrical devices and/or other non-medical electrical devices creates a medical system which must comply with the system standard

EN 60601-1-1 / cUL 60601. Before putting the system into service, a specialist is required to ascertain its conformity with the system standard.

WARNING:

Personal Injury — Before putting the device into service, check all cables for signs of damage. Damaged cables must be replaced immediately with the original manufacturer's cables. The safety information and certificates do not apply when cables from other manufacturers are used.

Do not open the flat-screen display or perform any service interventions. This may render your warranty claims null and void. Only authorized technicians are permitted to service the flat-screen display.

Do not put the flat-screen display into service

- when liquids have entered the device,
- when it was dropped and the housing is damaged.

Do not immerse the devices into liquids.

- Disconnect the power supply from the power line before cleaning. Use a moist cloth.

WARNING:

Equipment Failure — Magnetic and electrical fields are capable of interfering with the proper performance of the devices. For this reason make sure that all devices operated in the vicinity comply with the relevant EMC requirements. X-ray equipment, MRI devices, radio systems, and cellular telephones are possible sources of interference as they may emit higher levels of electromagnetic radiation.

Keep the system away from these devices and verify its performance before use.

WARNING:

Risk of Suffocation — Dispose of the packaging material, observing the applicable waste-control regulations and keeping it out of children's reach.

CAUTION:

Personal Injury — All devices used must comply with the applicable IEC/EN or ISO standard (PCs, for instance, must comply with IEC 60950). This applies to custom designs in particular.

During operation from flat-screen display (contact to monitor) do not simultaneous touch patient.

CAUTION:

Personal Injury, Equipment Damage — Check that the ambient conditions specified by the manufacturers of the different devices are ensured.

Before cleaning the flat-screen display, turn it off and remove power cord from power supply. Do not spray liquid cleaning agents directly onto the display. Spray the cleaning agent onto a cloth and wipe the display clean without exerting any pressure.

Do not place any objects on the signal cables. Route the signal cables and the power cable to the flat-screen display such that they do not present a stumbling hazard.

CAUTION:

Equipment Damage — Do not set up the flat-screen display in the immediate vicinity of a window. Rain, water, humidity and sunlight may damage the flat-screen display.

Do not exert pressure on the LCD. Excessive pressure may permanently damage the display.

For safe storage of the flat-screen display, a temperature between -20°C and +60°C must be ensured. Temperatures above or below this range may permanently damage the flat-screen display. Always store your flat-screen display in its original shipping box.

WARNING:

Personal Injury — During intracardiac application, it is recommended to connect the individual devices to the room's potential equalization system via separate potential equalization cables.

For intracardiac application, the application guidelines for medical electrical devices set forth in the German standard VDE 0753, part 2, must be observed.

Manufacturer's declaration of compliance with standards and directives



EG Declaration of Conformity

Manufacturer Richardson Electronics GmbH
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Tel.: +49 (0) 771 / 8300-0
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Product: Medical Monitor (product group 1)
MD-CP42AUPG-MED
MD-CP42AUxx-MEDX (chassis without front bezel)

Classification: **I**
(Directive 93/42/EWG)

We declare in own responsibility, that the above named products correspond to relevant regulations according to the following EG guidelines and standards.

Directive:

Directive 93/42/EWG of the Council of 14. Jun. 1993

Standards:

DIN EN 13485: 2009	Medical Products-Quality management system
IEC 60601-1 : 2007	General Requirements Of Basic Safety and Essential Performance
EN 60601-1-2: 2007	EMC-Directive
2002/95/EG: 2003-01	RoHS
93/68/EWG: 1993-07	CE-Marking

EMC-Tests have been carried out using standard cables with cables length of up to 2,5 meters. If longer cables are used, additional tests might be necessary to prove compliance with the EMC-directive.

93/68/EWG: 1993-07

CE-Kennzeichnung



Your Medical Display MD-CP42AUPG-MED

Before you start to install your medical display, make sure the carton box is not damaged and that all equipment is delivered completely.

Transport Damage

If the equipment has obviously been damaged in transit, make a written report immediately upon arrival of the goods and notify the shipping agent. The shipping agent must be informed of hidden damage in transit in writing within 2 work days.

Unpacking

Before unpacking the flat-screen display, prepare a suitable area for its set-up. Choose a location where the display will not be frequently exposed to direct sunlight or other strong sources of light. The light reflects on the display, dazzling you, and you will have problems seeing the displayed information.

After unpacking the display, check whether the shipment is complete and all items are intact:

MD-CP42AUPG-MED

- User's Manual
- DVI cable
- 2 x Power cord (UK & EU)
- Remote Control

If items are missing or damaged, contact your dealer immediately. Keep the packaging material and the shipping carton for storage or shipment of the flat-screen display.

Setup and positioning

If you use our wall mount system (Option VESA 200) to mount the MD-CP42AUPG-MED monitor to a wall with its VESA 200 adaptor, please make sure, that all data links and plug connections are easily reachable.

Please refer to the references from next pages. Circuit points for signal cables and power cord are located on back of the flat-screen display. There is an illustration 2 a detailed identification and description.

Choose a location where sunlight or other bright light does not directly fall on the display. The flat-screen display should not be exposed to excessive heat, humidity or direct sunlight, because this could cause damage to the device.

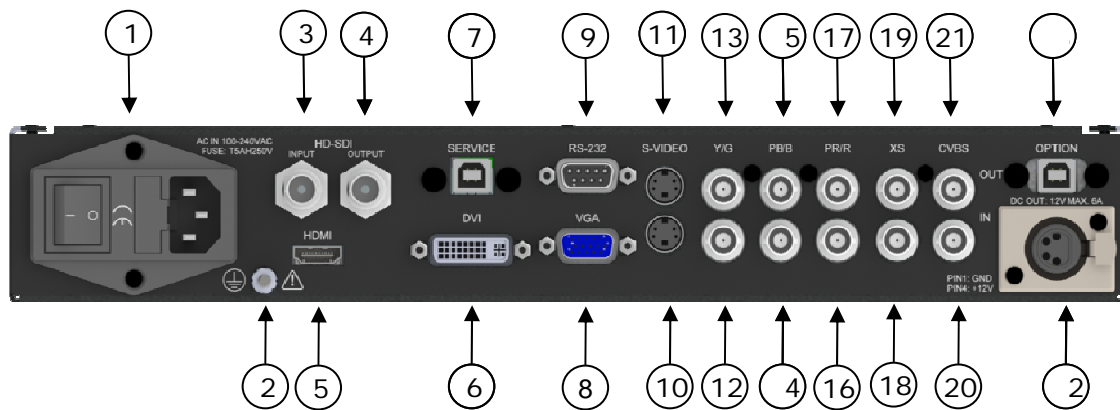


Illustration 2 – Connectors and cabling of MD-CP42AUPG-MED

To connect the cables

1. AC power input unit
The connection for energy supply is identified with "POWER". Connect AC power cord with this input. Plug into a power socket other side of power cord. The AC power input unit contained a ON/OFF switch, two fuses and the mains connection.
2. Earth conductor
Connect the Earth Conductor with little resistance with protective earth. After installation examine carefully the efficiency from this protective conductor connection before starting up.
3. HD-SDI-Input Connector
Connect SDI video connector and a SDI video output device with a 75-Ohm coaxial cable (e.g. Camcorder)
4. HD-SDI-Output Connector
5. HDMI-Input Connector
6. DVI-D Digital Input Connector
Connect the DVI cable to this connector and to your graphic adapter
7. Service not used
8. VGA-Input
connect the VGA cable to this connector and to your graphic adapter
9. Remote Control RS-232 Connector
Connect this input with a RS-232 cable and with corresponding PC interface.
10. S-Video input connector
Connect a S-Video signal cable to this connector and a S-Video output video device.
11. S-Video output connector
12. Y/G-Input Connector
For Pr,Pb,Y and Xs-Input (Component) signal or alternative RGBS-Input signal
No. 14,16,18 and 20 Connect a component video cable to this connector and a component video output device (e.g. DVD, High Definition (HD), RGBS video image).
13. Y/G-Output Connector

14. PB/B-Input Connector
For Pr,Pb,Y and Xs-Input (Component) signal or alternative RGBS-Input signal
No. 14,16,18 and 20 Connect a component video cable to this connector and a component video output device (e.g. DVD, High Definition (HD), RGBS video image).
15. PB/B-Output Connector
16. PR/R-Input Connector
For Pr,Pb,Y and Xs-Input (Component) signal or alternative RGBS-Input signal
No. 14,16,18 and 20 Connect a component video cable to this connector and a component video output device (e.g. DVD, High Definition (HD), RGBS video image).
17. PR/R-Output Connector
18. XS-Input (synchronization) Connector
For Pr,Pb,Y and Xs-Input (Component) signal or alternative RGBS-Input signal
No. 14,16,18 and 20 Connect a component video cable to this connector and a component video output device (e.g. DVD, High Definition (HD), RGBS video image)
19. XS-Output (synchronization) Connector
20. CVBS/Composite Video input connector
Connect a composite video cable to this connector and a video output device
21. CVBS/Composite Video output connector
22. 12V DC Output Connector
You can contact a Media player or a Mini-PC with a 12V DC Input voltage up to a maximum power consumption of 6A (max. power consumption 72W).
The user has take care for acceptability within a medical system.
23. OPTION Connector Optional In-/Output for additional functions.

CAUTION:

When you disconnect the cord/cables, be sure to hold the connector and not the cable itself.

Controls & Functions

The OSD Wheel Knob

(On Screen Menu) The OSD Wheel Knob is a multi-functional device located on the right side of the front bezel. It has three movements - rotate upward, rotate downward and press inward as a button.

- Rotate Downward : Move Up/Right, Increase
- Rotate Upward : Move Downward/Left, Decrease
- Button Press : Execute, Do, Save

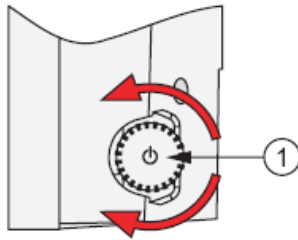


Illustration 3 – OSD Wheel Knob

Switch ON/OFF the flat-screen monitor with his power switch.

1. Switch-ON/OFF
Move monitor from standby to operation by pressing the OSD Wheel knob.
To switch-off the monitor press the OSD wheel knob two seconds until the monitor will move to standby.

Handling of OSD-Menu

Press the OSD wheel knob, by switched-on flat-screen display, to overlay the OSD-Menu. With the three functions from OSD wheel know you can make your adjustments within the OSD-Menu.

- Rotate upward: moving upwards, move to right side, increase value.
- Rotate downward: moving downwards, move to left side, decrease value.
- Press button: Activate function, activate, store.

Mode	Power consumption (only flat screen)
ON	Approx. 250W
STANDBY	Approx 25W
OFF	

On-Screen Display

The OSD menu is activated by pressing the OSD wheel knob inward and you can select and adjust the function of your choice by rotating and clicking the OSD wheel knob. The main menu displays a list of submenu icons and the current video input mode. Rotate the OSD wheel knob to move the highlights to the control you would like to adjust, then press the OSD wheel knob inward to select that control or to activate that function. Depending on the OSD wheel knob selected, a submenu of the control with a status bar will appear. Rotate the OSD wheel knob to adjust the control. When you have finished making the adjustments, the setting is saved automatically by exiting the control function. If you do not touch the OSD wheel knob for 3 seconds, the OSD is automatically exited saving your current settings.

OSD – Main Menu Display

The OSD menu is displayed with icons, adjustment items, and setting values as shown below.

The charts below display the function tree and brief explanations of the functions. Depending of main display channel, some menus are greyed and not to use.



Illustration 4 – OSD Main Menu

The Main Menu consists of followings menu points:

Exit	Close the OSD screen
Input-Source	Allows to select the input signals of the display: VGA, DVI, HDMI, S-Video, Composite, Component, RGBS and SDI
Image Settings	The picture menu allows to make changes of the picture
Color Mode	Allows to select color mode or color temperature
PIP - Settings	Allows to set PIP, POP parameters and settings
OSD - Settings	Set the parameters for OSD (Language, Time etc.)
Management	Contains several adjustments in order to change miscellaneous properties of your display, e.g. Scaling, Recall etc.

Menu Input-Source

Select the Main-Input signal of your display.

Exit	Returns to Main Menu
Analog VGA	Select DVI 15-pin input signal (analog)
Digital DVI	Select DVI 24-pin input signal (digital)
HDMI	Select HDMI input signal (digital)
S-Video	Select S-Video input signal (Video)
CVBS	Select Composite (CVBS) input signal (Video)
YPbPr/YCbCr	Select Component input signal (Video)
RGBS	Select RGBS input signal (Video)
SDI	Select HD-SDI input signal (Video)

Image - Settings

The picture menu allows making changes of the picture. Following sub menus are available:

Exit	Returns to Main Menu
Auto - Setup	Automatic adjust of Image parameters
Brightness	Set Brightness of the Image; Range: 0 means dark, 100 is bright
Black Level	Adjust black level of the screen. The larger the value is, the brighter the brightness of the background contrast is, and vice versa. Adjustable at the range from 0 to 100.
Contrast	Adjusts the contrast of the full screen at the range from 0 to 100.
Saturation	Adjust saturation of the screen. The larger the value is, the more intensive is the specific hue. Adjustable at the range from 0 to 100.
Hue	Adjust gradation of colour. Adjustable at the range from 0 to 100.
Sharpness	Adjust sharpness of the screen. The larger the value is, the outline gets sharper. To make characters look sharper, set a large value. To make pictures and images look finer, set a small value. Adjustable at the range from 0 to 10.
Display	Adjust the horizontal position of the display. When rotating Control dial clockwise, the display moves to the left, and vice versa. For the digital input DVI, this function is not available. Adjust the vertical position of the display. When rotating Control dial clockwise, the display moves upward, and vice versa. For the digital input DVI, this function is not available.
Frequency/Phase	Adjust the Frequency and phase of the display. Not available for digital inputs. Set manually clock and phase

Video-Setup	<p>Image Settings for the analog video inputs. For the digital inputs, this function is not available.</p> <ul style="list-style-type: none"> ▶ Main MAD Mode: Motion adaptive de interlacing. ▶ Noise Reduction: <ul style="list-style-type: none"> ▶ Dynamic NR Mode: Noise filter. ▶ MPEG NR Mode: Noise filter for compressed video ▶ Sharpness Noise Coring: small noise reduction filter ▶ Film Mode: Improvement for cinematic movie playing. ▶ DCDI: Directional Correlation Deinterlacing is a digital enhancement method.
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Menu Colour Mode

Selects the colour mode or colour temperature.

Exit	Returns to Main Menu
Normal	<p>Adjust preset colour temperature of Cool, Neutral, Warm or User for customized red, green and blue levels: The user can adjust and set tones.</p> <ul style="list-style-type: none"> - R Adjust red and equivalent colours at the range from 0 to 100. The greater the value is, the deeper the colour is, and vice versa. - G Adjust green and equivalent colours at the range from 0 to 100. The greater the value is, the deeper the colour is, and vice versa. - B Adjust blue and equivalent colours at the range from 0 to 100. The greater the value is, the deeper the colour is, and vice versa.
Gamma 1.8	Presetting for Gamma value 1.8
Gamma 2.0	Presetting for Gamma value 2.0
Gamma 2.2	Presetting for Gamma value 2.2
Gamma 2.4	Presetting for Gamma value 2.4
Monochrome	Presetting for Gamma value Monochrome
Calibration	Presetting for Gamma value calibration
DICOM	Presetting for Gamma value DICOM (med. Standard)

PIP Settings

Settings for PIP / POP functions and its parameters.

Exit	Returns to Main Menu
PIP Mode	Switch between PIP and POP (Picture on Picture) und OFF Mode
PIP Channel VGA	Select PIP Channel VGA (analog).
PIP Channel DVI	Select PIP Channel DVI-Input (digital).
PIP Channel HDMI	Select PIP Channel HDMI-Input (digital).
PIP Channel S-Video	Select PIP Channel S-Video-Input (Video).
PIP Channel CVBS	Select PIP Channel CVBS Input.
PIP Channel YPbPr/YCbCr	Select PIP Channel Component-Input
PIP Channel RGBS	Select PIP Channel RGBS-Input
PIP Channel SDI	Select PIP Channel HD-SDI-Input
PIP Position	Set format and position of PIP Image
SWAP	Swap main image channel and PIP Channel
PIP Image	Change image settings of PIP channel

OSD - Settings

Utility contains several adjustments in order to change miscellaneous properties of your display, e.g. language, OSD position etc.

Exit	Returns to Main Menu
OSD Position	Adjust the OSD position on the screen. OSD H. Position: When rotating OSD wheel knob clockwise, OSD moves to the right, and vice versa. OSD V. Position: When rotating OSD wheel knob clockwise, OSD moves downward, and vice versa
Language	Selecting this control, then rotate the Control Dial to select the language you want: English, French, German, Italian, Spanish, Japanese. Press the OSD wheel knob to execute when selected
OSD - Timer	Time to show OSD on Image
Tranparency	Transparency of OSD on screen
Memory Save/Load	Save and load of individual settings

Management-Menü

Setting of global parameters

Exit	Returns to Main Menu
Scaling	Setting of image scaling: Full, 1:1, 4:3, 16:9, 16:10, Best Fit, Fit With, Fit Hight, Over Screen. Zoom factor H.- size of picture V.-size of picture
Auto Setup	On / Off Automatic Setup at input change
ALS	Automatic Light Sensor On / Off
Auto Source	Automatic Set of main picture channel
New Timing Table	Setup of new timing tables
Recall	Initialize the data such as display position and automatic adjustment data to factory default

The OSD Remote Control

With the OSD Remote Control is it very comfortable to make your display settings. Mount batteries before use remote control. Needed batterie size is AAAA. Collect used (empty) batteries for recycling and disposal. Point with active side of remote control to monitor. Maximum range of remote control is about 2m.



Illustration 5 – OSD Remote Control

Power symbol	Switch-ON /-OFF the monitor.
Volume +	Hotkey for Brightness menu In brightness menu it increase brightness value.
Volume -	Hotkey for Brightness menu In brightness menu it decrease brightness value.
Speaker symbol	Activate the OSD menu. Together with Channel +, Channel – and speaker symbol you can make your adjustments. The functions are Overlay OSD, Execute, Do and Save.
Channel +	Rotate upwards, increase selected value.
Channel -	Rotate downwards, decrease selected value.
MISC	No function.

Cleaning and Disinfection

Equipment Surface

WARNING:

Shock Hazard — Disconnect the AC power cord from the power input connector from flat-screen display before cleaning or disinfection from monitor surface.

Do not reconnect the devices to the power line before all cleaned parts are completely dry.

- Wipe the equipment surface down with a moist cloth; do not allow liquid to enter the equipment. All cleaning agents and disinfectants commonly used in hospitals are suitable. Do not use abrasive products.

CAUTION:

Personal Injury, Equipment Damage — Strictly observe the instructions for use of the cleaning agents and disinfectants supplied by the manufacturers.

Connection Cables

- Disconnect the cables from the device and remove the AC power connector before cleaning or disinfection. When disconnecting the cable, be sure to pull on the connector, not on the cable.
- **Clean** the cable by rubbing it down with a cloth moistened with soap water. Use a **disinfectant** for disinfection. Do not immerse the cable in liquid.

Appendix

Technical Information*

(* Applicable after a minimum warm-up time of 30 minutes)

Module	42 Inch Full HDTV-TFT-LCD, diagonal 106,9cm
Active Area	930,2mm horizontal x 523,3mm vertical
Resolution	max. 1920 x 1080, max. 85Hz
Pixel pitch	0,484 mm
Colors	16.7 Million
Contrast ratio	3500:1 typical
Brightness	700cd/m ² typical (without protection glass/without touch screen)
Backlight	16 CCFL lamps
Response Time	6,5ms
Viewing angle	+89° / -89° horizontal / +89° / -89° vertical
Input Signal	RGB-Video analog 0.7Vpp TTL pos./pos. Separate Sync, Composite Sync, Sync on Green Vertical sync signal: TTL level 2.5~5.5V DVI-D
Video Input Signal	NTSC, PAL, SECAM, SVHS & FBAS S-Video BNC connector: Composite signal BNC connector: Component signal / RGBS signal HD-/SD-SDI connector: Compliant to SMPTE-292M
Power management	according to VESA® DPMS
Internal power supply	Alternation current input: 100 - 240VAC, 50 - 60Hz
Power consumption	max. 350W
Fusing	Two blowing Fuses T5A H 250V , Size 5x20mm
Dimensions	(1002 x 595 x 118.5)mm (W x H x D)
Weight	approx. 36 kg with front bezel & protection glass, without VESA adaptation
Temperature Range	Operation: 0°C to ~ 35°C Storage: -20°C ~ +60°C
Humidity:	Operation: 20% ~ 85%, (no condensation) Storage: 10% ~ 90%, (no condensation)
Plug & Play	VESA® DDC2B
Approvals	EN60601-1, CE

Despite high quality controls of the panel manufacturer sometimes defect pixels can not be avoided. Compare with specification of panel manufacturer.

Timings

VGA / DVI / RGBS	Up to WUXGA 1920 x 1080@ 60Hz. VESA 1280 X <u>1024@75/60Hz</u> , VESA 1024 X <u>768@85/75/70/60Hz</u> , VESA 800 X <u>600@85/75/72/60/56Hz</u> , VESA 640 X <u>480@85/75/72/60Hz</u> , Super VGA, VGA, Mac 832 x <u>624@75Hz</u> , Power Mac and more.
YPbPR	1920 x 1080I, 720 x 480P, 720 x 480I 1280 x 720P, 720 x 576P, 720 x 576I
Composite	NTSC/PAL
S Video	NTSC/PAL
SDI	Complied with SMPTE 292M, SDI-HD & SMPTE 259M, SDI-SD.

Illustration 6 – Timings

Completion technical data

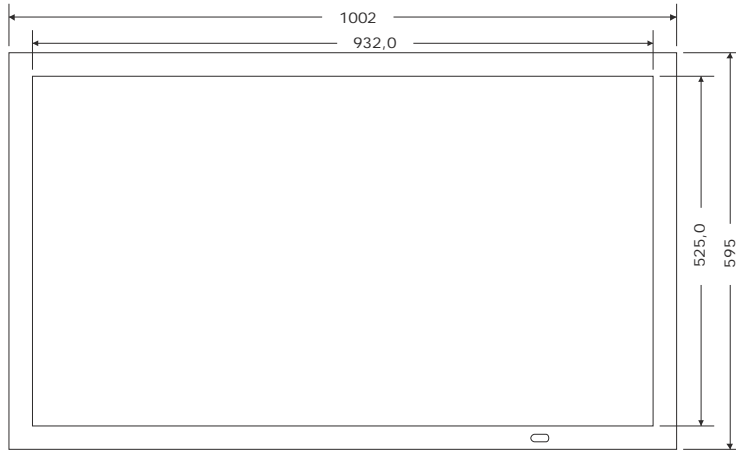
Reference to maximum cable lengths for the different input signal sources.

Input Signal Source	Maximum cable length	Remark
VGA	5m	
DVI	5m	
RGB	5m	
YPbPr	5m	
S-Video	5m	
CVBS	5m	
HD-SDI	50m	
RS-232	100m	9600 Baud

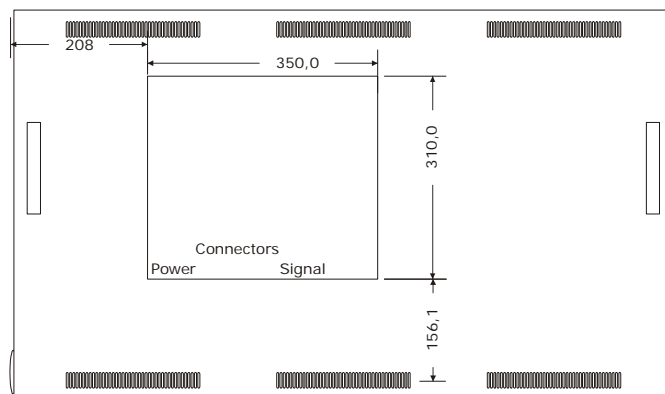
Corresponding to table above we grant correct function in combination with suitable signal cables and signal sources. Longer cable lengths are maybe possible with special signal cables, for this is the user responsible.

External Dimensions

Frontview / Vorderansicht



Rearview / Rückansicht



Sideview / Seitenansicht

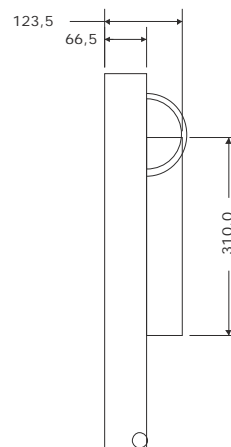


Illustration 7 – External Dimensions

Dimensions in mm, Tolerance: DIN 2768-1 mittel
 Abmessungen in mm, Toleranz nach DIN 2768-1 mittel

Instruction set for serial communication with RS-232

Baud rate: 9600 (bps)
Data bit: 8 bit
Parity: none
Stop bit: 1 bit

Note: All commandos are made by combination of numeric value which is expressed by hexadecimal format. Like as "0A", "FF".

Note: All communication needs a handshake replay.

1.0 Control Read command:

command format: 04 03 ID CK1

reply command format: 04 ID DD CK2

CK1: checksum for checking command weather valid. CK1=100-04-03-ID

CK2: checksum for checking command weather valid. CK2=100-04-ID-DD

1.1 Color Mode status (ID=0x01)

command 04 03 01 CK1

reply: 04 01 00 CK2 - Gamma OFF mode.

reply: 04 01 01 CK2 - Gamma2.0 Mode.

reply: 04 01 02 CK2 - Gamma2.2 Mode.

reply: 04 01 03 CK2 - Gamma1.8 Mode.

reply: 04 01 04 CK2 - DICOM Mode.

reply: 04 01 05 CK2 - Calibration Mode.

1.2 Color temperature status. (ID=0x03)

command 04 03 03 CK1

reply: 04 03 00 CK2 - Cool

reply: 04 03 01 CK2 - Neutral

reply: 04 03 02 CK2 - Warm

reply: 04 03 03 CK2 - User

1.3 Source input status.(ID=0x04)

command 04 03 04 CK1

reply: 04 04 00 CK2 - DVI-I Analog Input.

reply: 04 04 01 CK2 - DVI-I Digital Input.

reply: 04 04 02 CK2 - DVI-D Digital Input.

reply: 04 04 03 CK2 - S-Video Input.

reply: 04 04 04 CK2 - Composite Input.

reply: 04 04 05 CK2 - YPbPr Input.

reply: 04 04 06 CK2 - RGBS Input.

reply: 04 04 07 CK2 - SDI Input.

1.4 Brightness status (ID=0x10)

command 04 03 10 CK1

reply: 04 10 DD CK2 - Brightness value(from 0x00-0x64)

1.5 Contrast status. (ID=0x11)

command 04 03 11 CK1

reply: 04 11 DD CK2 - Contrast value(from 0x00-0x64)

1.6 ALSON/OFF.(ID=0x0C)

command 04 03 0C CK1

reply: 04 0C 00 CK2 - ALS OFF.

reply: 04 0C 01 CK2 - ALS ON.

1.7 Scaling Control(ID=0x09)

command 04 03 09 CK1

reply: 04 09 00 CK2 - 1:1.

reply: 04 09 01 CK2 - Aspect.

reply: 04 09 02 CK2 - FULL.

1.8 PIP/SWAP Control(ID=0x08)

command 04 03 08 CK1

reply: 04 08 00 CK2 - PIP OFF.

reply: 04 08 01 CK2 - PIP ON.

reply: 04 08 02 CK2 - SWAP.

1.9 Power On/OFF Control(ID=0x07)

command 04 03 07 CK1

reply: 04 07 00 CK2 - Power OFF.

reply: 04 07 01 CK2 - Power ON.

1.10 Lamp Status(ID=0x25)

command 04 03 25 CK1

reply 04 25 DD CK2 - Lamp sensor Data

1.11 Temp Status(ID=0x26)

command 04 03 26 CK1

reply 04 26 DD CK2 - Temperature sensor Data

2.0 Control Write command:

command format: 05 04 ID DD CK

reply command format: 03 0C F1

DD:control data value

CK:checksum for checking command weather valid. $CK = \sim(05+04+ID+DD) + 1$

2.1 Color Mode status (ID=0x01)

command 05 04 01 00 CK -set to Gamma OFF Mode

command 05 04 01 01 CK -set to Gamma2.0 Mode

command 05 04 01 02 CK -set to Gamma2.2 Mode

command 05 04 01 03 CK -set to Gamma1.8 Mode

command 05 04 01 04 CK -set to DICOM Mode

command 05 04 01 05 CK -set to Calibration Mode

reply: 03 0C F1 - ack.

2.2 Color temperature (ID=0x03)

command 05 04 03 00 CK - Cool

command 05 04 03 01 CK - Neutural

command 05 04 03 02 CK - warm

command 05 04 03 03 CK - User.

reply: 03 0C F1 -ack.

2.3 Source switching (ID=0x04)

command 05 04 04 00 CK - select DVI-I Analog Input.
command 05 04 04 01 CK - select DVI-I Digital Input.
command 05 04 04 02 CK - select DVI-D Digital Input.
command 05 04 04 03 CK - select S-Video Input.
command 05 04 04 04 CK - select Composite Input.
command 05 04 04 05 CK - select YPbPr/YCbCr Input.
command 05 04 04 06 CK - select RGBS Input.
command 05 04 04 07 CK - select SDI Input.
reply: 03 0C F1 -ack.

2.4 Brightness control (ID=0x10)

command 05 04 10 DD CK -control Brightness value(from 0x00-0x64) if color mode
!= DICOM Mode
reply: 03 0C F1

2.5 Contrast control. (ID=0x11)

command 05 04 11 DD CK -control Contrast value(from 0x00-0x64) if Color mode is
normal mode
reply: 03 0C F1

2.6 ALS ON/OFF(ID=0x0C)

command 05 04 0C 01 CK - ALS ON
command 05 04 0C 00 CK - ALS OFF
reply: 03 0C F1
PS:if Color Mode=DICOM Mode or if Color mode=Calibration mode ALS always ON

2.7 Scaling Control(ID=0x09)

command 05 04 09 00 CK - set to 1:1.
command 05 04 09 01 CK - set to Aspect.
command 05 04 09 02 CK - set to FULL.
reply: 03 0C F1

2.8 PIP/SWAP Control(ID=0x08)

command 05 04 08 00 CK - set to PIP_OFF.
command 05 04 08 01 CK - set to PIP_ON.
command 05 04 08 02 CK - set to SWAP.
reply: 03 0C F1

2.9 POWER ON/OFF Control(ID=0x07)

command 05 04 07 00 CK - set to Power_OFF.
command 05 04 07 01 CK - set to Power_ON.
reply: 03 0C F1

Support and Service

Canvys a Division of Richardson Electronics GmbH, from Donaueschingen/Germany is active in national and international markets. Full application support and service is available. For technical support or service problems, please contact our service team at:

Canvys – Visual Technology Solutions
A Division of Richardson Electronics GmbH
Raiffeisenstr. 5
78166 Donaueschingen
Germany

Tel.: +49 (0)771 / 8300-0
Fax: +49 (0)771 / 8300-80
Email: info-europe@canvys.com
Internet: <http://www.canvys.com>

Repairs:

Equipment for repair must be returned in the original shipping carton (postage prepaid) to the above service address. RMA number and error description must be included.

Please request the RMA number under the following link:

<http://teklink.rell.com/MRcgi/MRentrancePage.pl>

After receipt of the equipment for repair we will send you an order confirmation and a cost estimate (for repairs after the warranty period).

For questions about servicing and repairs, please call your contact in our Sales team. There, you will receive more detailed information about handling service and repair cases.

Product Warranty

In case of defects, please advise Richardson Electronics GmbH according to the aforementioned RMA Handling Procedures promptly, but no later than 8 days after receipt of goods, or in case of hidden defects no later than 3 days after discovery. The customer has no right to return the goods without prior approval from Richardson Electronics GmbH.

If there has been no prior agreement, the warranty-period is 24 months commencing from the invoice date by Richardson Electronics GmbH.

Richardson Electronics GmbH will not bear costs resulting from re-performance, particularly infrastructure and transport costs, if the goods have been placed to another location than the place of delivery. The customer shall choose the lowest-price form of transportation or our pickup service through Richardson Electronics GmbH.

Claims for warranty defects shall not exist in cases of:

- improper usage
- modification of the goods by the customer
- using the goods outside its field of application or its electrical specifications
- neglect or misuse of the goods by the customer
- natural wear and tear and damages, defects, reduced output, and changes of conditions or operation of our goods due to extraneous causes (e.g. impact, blows, agitation, water, fire), improper storage, treatment or installation, unusual climatic conditions, special conditions at receipt or operational conditions at the location of use, or force majeure
- defects due to construction and material deficiencies, when the customer has specified the construction or the material
- image retention on the LCD-Panel, which is caused by permanent pictures as well as Gap Mura on the LCD-Panel

If there are any other issues which have not been stated, the current version of the General Terms and Conditions of Delivery and Payment issued by Richardson Electronics GmbH should apply.

Disposal

For the disposal of your flat-screen display, please observe the applicable local regulations.



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